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Ninety-three research documents are annotated under these classifications: (1) History and Development, (2) Status Studies, (3) Manpower, (4) Curriculum (5) Selection Practices, (6) Guidance, (7) Follow-Up Studies, and (8) Miscellaneous. Each annotation gives the purpose and conclusions from the research studies. Four doctoral theses which are in progress are also listed. (EM)

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Research on Apprenticeship

Annotated and Classified Listing of Related Studies Reported 1930-1962

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RESEARCH ON APPRENTICESHIP.

An Annotated and Classified Listing of Studies, 1930-1962.

A PART OF THE MICHIGAN VOCATIONAL EDUCATION EVALUATION PROJECT

Sponsored by:

State Board of Control for Vocational Education

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FOREWORD

The Michigan Vocational Education Evaluation Project was authorized and financed by the State Board of Control for Vocational Education. Twenty-five separate sub-researches comprise the work of the over-all evaluative study. Since apprenticeship training has been an integral part of the vocational education structure, it is understandable that one study should focus on this area.

At a joint meeting of representatives from the Bureau of Apprenticeship and Training, the Michigan Department of Public Instruction, and Michigan State University, it was recommended that the Project take steps to summarize the research on apprenticeship training. This document fulfills that commitment.

The Michigan Vocational Education Evaluation Project requested Mr. Walter A. Busby to assume responsibility for the execution of the task. The Project is most grateful to him for his contribution not only to the Project but to the over-all field of apprenticeship.

Lawrence Borosage, Director

ACKNOWLEDGMENTS

The major source for the report was the material recorded in the U. S. Office of Education publications: Research in Industrial Education: Summaries of Studies 1930-1955, and Research in Industrial Education: Summaries of Studies 1956. An acknowledgment of credit for the splendid work done by individuals and committees is given in each of these bulletins.

Another important source was the outcome of a national survey of agencies directly or indirectly involved with apprenticeship training. These included: Bureau of Apprenticeship and Training, U. S. Department of Labor; state apprenticeship agencies; universities and colleges; state departments of education; and management and union associations. Sincere appreciation is extended to all these groups for their interest and cooperation in submitting data.

Finally, the document would not have been brought to completion without the editorial assistance of Dr. Peter Haines and Mrs. Roslyn Blum.

Walter A. Busby

PREFACE

To achieve its potential, a nation must make optimum use of its manpower resources. America's constant goal, declares the National Manpower Council; "must be the best possible education and training for all in order to help them prepare for life and work."[1] In our industrial society there is an expanding need for an adequate pool of technically trained and highly skilled craftsmen. Modern industry is now and will be in the future helplessly dependent on the highly developed abilities and technical knowledge of its skilled workers. To train men to fill these vital positions, industry has made extensive use of apprenticeship (on-the-job experience acquired under the direct supervision of a qualified craftsman). In fact, many industrial leaders are convinced that it is the best possible way to prepare young men to become skilled craftsmen.[2]

Manpower is also affected greatly by the fact that industry in the United States is characterized by constant change. Thus, new methods and techniques require additional technical knowledge and new skills. Consequently, an adequate program of research is necessary to insure that apprenticeship programs are meeting the requirement of an industrial society always influx. Yet simply to conduct research

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[1]National Manpower Council, A Policy for Skilled Manpower, New York: Columbia University Press, 1954, p. 10.

[2]Harry Kursh, Apprenticeship in America, New York: W. W. Norton and Co., 1958, p. 3.

is not enough, for what good is research if those interested do not know about it. An adequate program of research must include an appropriate process of dissemination. This bibliography is an effort in that direction. It will be useful to those concerned with the literature in the field of apprenticeship as a foundation for research as well as a basis for action at the policy, supervision, and instructional level.

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HISTORY AND DEVELOPMENT

1. American Apprenticeship and Its Contribution to Industrial Arts. Moses, Morgan C. Masters Thesis, North Texas State College, 1950, 88 pp.

   Purpose: To show, through the development of American apprenticeship, certain factors and influences that have contributed to the growth of industrial arts in the public schools of the United States.

   Conclusions:
   1. Industrial arts, with general objectives patterned after apprenticeship principles, is a vital stepping stone in the present-day efforts to train better tradesmen and more skilled craftsmen through apprenticeship.

2. A Study of Trade Education and Apprentice Training in the United States with Special Reference to Certain Corporation Training Programs. Meyers, W. K. Masters Thesis, North Texas State College, 1950, 92 pp.

   Purpose: To trace the apprentice training program in the United States with special reference to certain corporation training programs.

   Conclusions:
   1. Apprentice training in the United States was patterned after the old English system.
   2. Labor organizations want a program of training skilled craftsmen. One of management's most vital assets is its skilled workmen.
   3. It should be the task of labor and management to organize and maintain training programs.

3. A Partial Study of Apprenticeship in the United States. Keinbolz, William. Masters Thesis, University of Southern California, 1931, 173 pp.

   Purpose: A study of certain selected apprenticeship programs in the United States, including their growth and development and present status.

4. The Apprentice Training Program of the United States Naval Gun Factory. Miller, Milton Evans. Masters Thesis, University of Tennessee, 1947, 123 pp.

   Purpose: A study of the training organizations, policies, regulations governing apprentice training curriculum and the shop training courses of the apprentice school, of the Naval Gun Factory in Washington, D.C. A history of the United States Navy Yard and Gun Factory from 1799 to 1947 is included.

5. A Study of Apprenticeship in the English Woodworking Guilds. Jenkins, Wesley E. Masters Thesis, Ohio State University, 1934.

6. A Comparative Study of the Medieval Apprenticeship System and the Modern Trade School System in the United States. Norberta, Sister. Masters Thesis, University of Notre Dame, 1939.

   Purpose: To compare modern-day apprenticeship training with the medieval systems.

7. A Manual for Apprentice Teachers and Coordinators in the State of Michigan. Duryee, Deo V. Masters Thesis, University of Michigan, 1943, 150 pp.

   Purpose: A historical background leading to present-day apprenticeship programs in the United States and more specifically in Michigan. Procedures to establish a program, indenturing, and model course of study.

8. The Development of an Apprenticeship Training Program for the Skilled Trades in a Small Repair Shipyard. Jakeman, Arthur E. Masters Thesis, West Virginia University, 1939, 90 pp.

   Purpose: An analytical description of the program for apprentice training in Norfolk, Virginia shipyards to point up the need of collaboration of work and related technical subjects.

9. A Historical Examination of the Purposes and Practices of the Education Program of the United Automobile Workers of America, 1936-1959. Linton, Thomas Edwin. Doctoral Thesis, University of Michigan, 1961, 600 pp.

Purpose: To determine the actual operational purposes of the UAW education program.

Conclusions:

1. The education program served to pass along the ideas and action programs of the union leaders.

2. The program was inclined to promote conformity to the current political values of the leaders and to discourage a critical assessment of the ideas that were presented.

3. The education work stressed the vocational aspects of leadership training for its secondary leaders, while at the same time the union tended to limit the educational opportunities of the general membership.

10. An Analysis of the Wisconsin Apprentice System. Matchett, E. J. Masters Thesis, University of Iowa, 1943, 55 pp.

Purpose: An analysis of Wisconsin apprentice law's historical background, relationships between the state apprenticeship program and the state program of vocational and adult education, and description of a plan inaugurated by the State Industrial Commission for the effective operation of the provisions of the law.

STATUS STUDIES

UNITED STATES

11. The Administrative Organization for the Apprenticeship Learnership Program in the Panama Canal Zone. Hosler, Fred W. Doctoral Thesis, Columbia University, 1938, 180 pp.

    Purpose: The study deals with the background and setting up of an apprenticeship program in the Panama Canal Zone; the need for the training program; changes in the secondary school curriculum which was necessary in order that the schools could serve the Canal Zone better; the organization and administration of the apprentice-learner school; and recommendations for the future.

12. Apprenticeship in Canada and the Northern Border States. McDill, William A. Masters Thesis, Colorado Agricultural and Mechanical College, 1948, 663 pp.

    Purpose: A comparison of apprenticeship training in Canada and the northern border states of the United States. Topics such as apprenticeship legislation and government plans, regulations, and standards are considered.

13. A Study of Selected Corporation Apprenticeship Training Programs. Russ, Clarence A. Masters Thesis, North Carolina State College, 1953, 49 pp.

Purpose: To ascertain the location of corporation apprenticeship programs available to North Carolina high school students, the types of training given in these programs, the qualifications required for apprentices, and the benefits of the apprenticeship programs.

Conclusions:
1. More than two-thirds of the apprenticeship programs covered in this study are available to North Carolina high school graduates.
2. These programs operated by old and reliable corporations give enterprising young men the opportunity to receive valuable training in a wide variety of highly skilled trades.

STATE

14. Survey of Apprenticeship Training Programs in Indiana. Woerdehoff, Frank W. Purdue University, 1958, 15 pp.

Purpose: To determine the status of apprenticeship training in Indian and provide information needed to plan intelligently for the future.

Conclusions:
1. The state should appoint a State Apprenticeship Council to act in advisory capacity to the State Board of Vocational Education.
2. The state should appoint a state supervisor to be responsible for apprentice education.
3. The state should conduct an annual statewide apprenticeship survey.

15. Apprenticeship and On-the-Job Training Programs in Iowa. Hanson, D.M. Masters Thesis, Iowa State College, 1949.

Purpose: To ascertain status and distribution of on-the-job and apprenticeship training programs in Iowa construction and manufacturing trades.

Conclusions:
1. In general, 3 out of 5 training programs were on-the-job classification with the largest percentage of programs being concentrated in cities of over 10,000.
2. Of the total of 2,926 training establishments surveyed, 1,138 were in the construction trade group, 403 in the manufacturing group, and 1,385 in the service trade group.

16. Status of Apprenticeships in Louisiana, St. Blanc, Francis C. Masters Thesis, Louisiana State University, 1953, 102 pp.

Purpose: To trace the historical development of the apprenticeship system in Louisiana, and to inquire into the administrative policies regarding apprenticeship.

Conclusions:
1. The large industrial enterprises are sharing the responsibility for the training of apprentices in skilled trades.
2. The largest number of apprentices were in the building trades.
3. Twenty-three state operated area trade schools served sixty-four parishes, and made available their service to all apprentices on a statewide basis.

17. The Serviceman's Readjustment Act to 1944: On-the-Job Training and Apprenticeship Program in Maryland, Gisriel, Austin E. Masters Thesis, University of Maryland, 1951, 113 pp.

Purpose: To present information about the Serviceman's Readjustment Act of 1944 relative to on-the-job training and the apprenticeship program in Maryland.

Conclusions:
1. Many amendments were made to the Serviceman's Readjustment Act of 1944.
2. Much more deliberation should be given to the details of administration of any future program. No provisions were made for progressive study and evaluation of the effects of the Veteran's Training Program.
3. The administration of any federal program of this nature should be on a local level.

18. Employee Training in New Jersey Industry. U. S. Department of Labor, Bureau of Apprenticeship and Training, Washington, D.C., 1960, 46 pp.

Purpose: A study of efforts to improve the job skill and technical knowledge of workers in New Jersey establishments with four or more employees.

Conclusions:
1. Approximately 16.2 of the 38,000 establishments surveyed were conducting training programs during 1959.
2. These establishments sponsored over 15,800 training programs of various types for employees at all levels and functions.
3. One out of nine employees were participating in such activities.
4. One-Fourth of all training programs were conducted by vocational-technical high schools and other outside educational organizations.
5. The average number of trainees per program was 5.2. However, in large establishments (over 500 workers) the average was 20.

19. A Look at Industrial Training in Mercer County, New Jersey. U. S. Department of Labor, Bureau of Apprenticeship and Training, Washington, D.C., 1959, 29 pp.

Purpose: A pilot study for the just previously mentioned survey.

Conclusions:
1. Approximately one-third of the establishments were conducting training programs.
2. More than one half of workers being trained were employees of large establishments (100 employees or over).
3. Two-thirds of the establishments were utilizing outside facilities. Public Vocational and technical facilities were most widely used.

20. Apprenticeship in Western New York State. Van Dusen, Edward B. Doctoral Thesis, Cornell University, 1949, 464 pp.

Purpose: A study of apprentices and apprenticeship in Western New York State, examining the historical background and the organizational structure of apprenticeship and the apprentices themselves.

21. A Compilation of Analyses of Trades Common to Oklahoma That Lend Themselves to Apprentice Training. Green, J. R. Masters Thesis, Oklahoma Agricultural and Mechanical College, 1935.

22. Apprenticeship Training in Tennessee. Clark, Vergil. Masters Thesis, University of Tennessee, 1952, 95 pp.

Purpose: To examine and evaluate apprenticeship training programs operating in Tennessee in cooperation with the public schools.

Conclusions:
1. Thirteen apprenticeship training programs were in operation in 21 trades at the time of study.
2. The most vexing and difficult problem is that of providing classes for scattered apprentices in non-industrial localities.
3. Electricity, carpentry, and plumbing ranked in this order of enrollment.

23. A Report of Utah's Apprenticeship Training Survey. Utah Department of Employment Security. Salt Lake City, Utah, 1958, 115 pp.

Purpose: To find out what changes in quantity and quality of training and other standards, if any, are desired in the apprenticeship program and its administration.

Conclusions:
1. The number of Utah employers currently participating in apprenticeship is relatively small.
2. Only about one-half of the apprentices who registered with the Utah State Apprenticeship Council have completed their agreement.
3. Over 10 per cent of apprentices are not receiving related instruction.
4. Insufficient numbers of apprentices are currently in training to provide for Utah's expanding needs.

24. A Study of the Responsibilities of the Wisconsin Part-Time Schools Relative to the Provision for Extension Education for Apprentices. Rossow, Clarence H. Masters Thesis, Colorado Agricultural and Mechanical College, 1938, 120 pp.

Purpose: An investigation of the part-time school in Wisconsin and its function. Several course outlines for apprentice training of mechanics are provided.

CITY

25. An Occupational Survey of Twenty-Four Trades in Duluth, Minnesota. Campaigne, George E. Masters Thesis, University of Minnesota, 1948, 63 pp.

Purpose: A survey of the needs of industries, and of vocational education in the schools of Duluth, plus practices of inducting boys into apprenticeship in the trades concerned.

26. The Manitoba Apprenticeship Training Program: A Study of the Development, Regulations, Functions, and Techniques. Addy, Bertram F. Masters Thesis, University of Minnesota, 1955, 128 pp.

Purpose: To gather and compile information, in concise form, for those interested in and responsible for the Provincial Apprenticeship Program.

Conclusions: 1. New conditions will require an expanding program.

2. A careful study of drop-outs is needed.

3. Greater use should be made of the trade advisory committees and the services available through the national employment service.

4. More emphasis should be placed on industrial relations, and efforts should be made to stimulate and develop interest in this field.

27. A Status Survey of Apprenticeship in San Diego, California. Hatalson, John W. Masters Thesis, San Diego College, 1953, 128 pp.

Purpose: To develop and organize data concerning apprenticeship program operations and functions, variations in apprenticeship standards among crafts and data concerning status of the labor supply in apprenticeship.

Conclusions: Individual summaries, made for each craft or program surveyed, presented a complete picture of the characteristics of apprenticeship training in the particular craft. Number, per cent, and means tabulations are included where applicable.

28. A Plan for Apprenticeship Training in the City of Santa Barbara, California. MacKenzie, Thomas T. Masters Thesis, Oregon State College, 1940.

Purpose: A study of the desirability of, and methods and laws affecting the training of apprentices in Santa Barbara, California.

29. Apprenticeship and Trade Extension Training--A Plan of Procedure for Promotion With Specific Application to Superior, Wisconsin. Jewson, Frank B. Masters Thesis, The Stout Institute, 1939, 222 pp.

Purpose: A study of the organization and development of the trade and apprenticeship training program of the state vocational school of Superior, Wisconsin. A discussion of the organization and function of the advisory committee system used in Superior is included.

INDUSTRY

30. Apprenticeship Training in the Detroit Automotive Industry. Kasey, Myron. Masters Thesis, Wayne State University, 1955, 45 pp.

Purpose: To become acquainted with the programs and to report some of the skills employed by the automotive companies in the building of tools and equipment.

Conclusions: 1. The Federal Bureau of Apprenticeship, the Michigan State Department of Vocational Education, the UAW-CIO International Union, the Board of Education, and the training departments of the automotive companies have an active part in apprentice training.

2. Apprentice programs may differ in contents and hours with each company, but basically they are the same.

31. Automotive Trade Survey. Oregon State Apprenticeship Council. 1216 S. W. Hall Street, Portland 1, Oregon, 1959, 10 pp.

Purpose: To determine the future need for skilled mechanics in Oregon as well as to secure information on the relative effectiveness of present programs.

Conclusions: 1. The supply of skilled mechanics in Oregon is limited.

2. A selling of apprenticeship training is needed.

3. Most of the employers interviewed are favorable to apprenticeship in general, yet do not hire apprentices themselves.

32. Construction Industry--Apprentice Training. The Associated General Contractors. Washington, D. C., 1960, 19 pp.

Purpose: To compile information on the status of apprenticeship training in the construction industry.

Conclusions: The registration, completion, and cancellation experience within each trade is summarized nationally. Recommendations are made for applying the results of the survey.

33. Apprenticeship and Training in the Electrical Contracting Industry. U. S. Department of Labor. Bureau of Apprenticeship and Training, W shington, D. C., 1959, 39 pp.

Purpose: To obtain information on which an evaluation of apprenticeship and training in the industry could be based. Out of this survey came the National Standards for the Electrical Contracting Industry.

34. Training--The Key to the Future: Apprenticeship in Electronic Occupations. U. S. Department of Labor. Bureau of Apprenticeship and Training, Washington, D. C., 1961, 50 pp.

Purpose: Varying techniques of training electronic technicians indicated a need for a detailed study of an electronic technician program which might serve as an example for establishing sound principles of apprenticeship in this complex trade field.

The Raytheon Company was selected because it pioneered in using apprenticeship in electronic occupations.

35. Apprenticeship and Training in Masonry Construction. U. S. Department of Labor. Bureau of Apprenticeship and Training, Washington, D. C., 1961, 39 pp.

Purpose: A status study of apprenticeship and journeyman training in masonry construction.

Conclusions:

1. There is a need for the revision of apprenticeship standards in many of the regions surveyed.

2. Only 251 of the 912 areas reported that related instruction was provided apprentices.

3. The masonry trades had a completion rate of 74% during the twelve month period ending March 31, 1960.

36. Employee Training in the Metalworking Industries of the Illinois-Iowa Quad-City Area. Pedersen, George Leslie. Doctoral Thesis, Bradley University, 1957, 164 pp.

Purpose: To ascertain the extent and details of apprenticeship, cooperative, supervisory, technical, and tuition-aid programs in 20 of the largest Quad-City metalworking industries. These results are compared with a survey of similar types of training in three of the largest automotive companies in Detroit.

Conclusions:

1. Fifteen plants have apprentices in training; the five other plants have conducted programs, but at the time had no apprentices in training.

2. College cooperative programs are sponsored in seven plants in the Quad-Cities and by all of the Detroit companies.

3. Supervisory training was found to be overlooked by many of the smaller industries in the Quad-Cities.

4. All larger industries in the Quad-Cities and all companies in the Detroit area have well-developed supervisory training programs.

5. Technical training, as a distinct type, was found to exist in only one Quad-City industry.

6. Tuition-aid programs are gaining popularity among industries in the Quad-Cities.

37. Training in Ordnance Plants. U. S. Department of Labor, Bureau of Apprenticeship and Training, Washington, D. C., 1953, 17 pp.

Purpose: A progress report by the Bureau of Apprenticeship to stimulate training in privately owned plants engaged in the manufacture of ordnance items.

Conclusions:

1. When compared with certain other trades, the firms tested were doing a relatively good job of meeting their own needs for skilled craftsmen.

2. However, when plants not training apprentices are considered, it is evident that not enough apprentices are being trained to meet the needs of the ordnance industry.

38. The St. Paul Sheet-Metal-Working Apprenticeship Training Program. Feierabend, H. J. Masters Thesis, University of Minnesota, 1950 57 pp.

Purpose: To examine the development and operation of a sound program of apprenticeship in a skilled trade.

Conclusions: 1. Men with much experience on apprenticeship committees have furnished the necessary enthusiasm and stability to keep the program functioning continuously and smoothly.

2. Careful selection of apprentices has resulted in nearly zero "turnovers" or "quits."

39. Apprenticeship and Training in the Contract Tool and Die Industry. U. S. Department of Labor. Bureau of Apprenticeship and Training, Washington, D. C., 1960, 31 pp.

Purpose: A status study of apprenticeship in the tool and die industry.

Conclusions: 1. Fifty-eight per cent of the establishments tested were not training apprentices.

2. Industry is training about 60 per cent of the apprentices necessary to replace journeymen lost due to death and retirement.

TRADE

40. How Many Carpenter Apprentices Should be in Training in the Lincoln Area? Hodgson, Jack O. Masters Thesis, Colorado Agricultural & Mechanical College, 1941, 71 pp.

Purpose: An investigation of the amount of building that has been done in the Lincoln, Illinois area from 1935 to 1940, the number of carpenters employed, and union regulations and contractors' ideas. Recommendations are made for more apprentices.

41. Survey of the Need for Apprenticeship Training in the Graphic Arts Industry for the Metropolitan Boston Area. General Committee for Apprentice and Other Training of the Graphic Arts Industry of Metropolitan Boston, 1953, 53 pp.

Purpose: To determine the characteristics and status of apprenticeship training in the graphic arts industry in metropolitan Boston.

Conclusions:
1. Not enough apprentices are in training to meet the growing needs of metropolitan Boston.
2. Full use of facilities for apprenticeship training is not being made.

42. A Half-Century of Experience in Training Machinists. U. S. Department of Labor. Bureau of Apprenticeship and Training, Washington, D. C., 1953, 15 pp.

Purpose: To analyze the operation of the apprenticeship system of the Kearney and Trecker Corporation, West Allis, Wisconsin, between 1901-1952.

Conclusions:
1. Over the years apprenticeship pays rich dividends.
2. Continued support of apprenticeship assures a steady suppy of skilled craftsmen.
3. Many apprentices become well qualified for supervisory positions.
4. Making a particular official responsible for training helps to improve the total program.

43. A Survey of Apprenticeship in Metal Trades in Manufacturing and Aircraft Industry. California Department of Industrial Relations, Division of Apprenticeship Standards, Room 139, San Francisco 11, California.

Purpose: To develop a picture of apprenticeship in manufacturing firms in order to determine what problems should be given consideration in order to meet the skilled manpower need of industry.

44. Fundamentals of Trade Education Apprenticeship in the Metal Trades Pickrel, Leon F. Masters Thesis, State University of Iowa, 1937, 58 pp.

Purpose: A study of and suggested curriculum for apprentice training of two classes of skilled workers in the metal trades--toolmakers and patternmakers.

45. Plumbing Apprenticeship and its Relation to Itinerant Instruction in Thirteen Wisconsin Cities for Years 1925 to 1930. Maeder, Frederick O. Masters Thesis, Colorado Agricultural and Mechanical College, 1933, 84 pp.

Purpose: A statistical analysis of the number of apprentice plumbers required by each of thirteen cities in Wisconsin.

46. A Measure of Efficiency and the Deficiency of the Training of Painting and Decorating Apprentices. Ewing, Claude H. Masters Thesis, Colorado Agricultural and Mechanical College, 1936, 86 pp.

Purpose: A survey of the one-hundred graduates of the Washburne Continuation and Apprentice School, Chicago, to determine the value of the school's training program for painting and decorating apprentices. Improvements in the programs are suggested.

47. The Need for Pattern-Making Apprentices in the Milwaukee, Wisconsin Area. Dietrich, Arnold J. Masters Thesis, Colorado Agricultural and Mechanical College, 1946.

Purpose: A survey of the need for pattern-making apprentices in the Milwaukee area. Union, apprentice, journeyman, and industry viewpoints are discussed.

MANPOWER

48. Manpower Requirements and Training Needs in Construction Occupations 1960-1970. U. S. Department of Labor, Bureau of Apprenticeship and Training, Washington, D.C., 1959, 12 pp.

Purpose: An analysis of the manpower requirements and training needs in construction occupations.

Conclusions:
1. A considerable growth in construction activity is expected during the next decade.
2. An estimated 1.2 million new craftsmen will be needed by 1970. This does not include replacement as a result of death and retirement.

49. Shortage of Skilled Manpower--Implications for Kalamazoo Businessmen. Thole, Henry C. Upjohn Institute, 1958.

Purpose: An analysis of problems employers have faced in Kalamazoo, Michigan, an area of labor shortage during 1956 and what steps these employers have taken to overcome the shortages of skilled laborers.

Conclusions:
1. This survey shows that there is an appalling lack of apprenticeship training in the metal working companies in Kalamazoo.
2. The lack of skilled workers is a serious threat to further expansion of firms in the area.

50. Manpower in Michigan. Michigan Employment Security Commission, 1960, 25 pp.

Purpose: An analysis of the demographic and economic changes in Michigan during the decade of the sixties, particularly as they relate to the constitution and utilization of Michigan's labor force.

Conclusions:
1. Michigan's population will continue to grow at a faster rate than the nation's.
2. Growth of Michigan's labor force will increase substantially in the sixties, reaching 3.7 million by 1970. This labor force will contain many more women under 25 and over 45.
3. Employment in service industries will grow faster than in production industries.
4. Trade and service will lead in employment growth.
5. Two-thirds of Michigan's unemployed job applicants failed to finish high school.

51. Mobility of Molders and Coremakers, 1940-1952. U. S. Department of Labor, Bureau of Labor Statistics, 1953, 105 pp.

Purpose: A study of the work experience, training, and personal characteristics of workers in a skilled occupation.

Conclusions:
1. The workers tested showed a strong attachment to their employers, to the occupation, and to the areas in which they worked.
2. Age and mobility were found to be closely related; older workers were less mobile than younger men.
3. Workers who did change jobs were able to shift freely among the various type foundries.

CURRICULUM

RELATED INSTRUCTION

52. A Study of Apprentices Enrolled in Related Instruction Classes in California Public Schools. Dobson, Clifford G. Doctoral Thesis, University of California, Los Angeles, 1956, 287 pp.

Purpose: To gather and evaluate information on the characteristics of apprenticeship programs in California that would reveal the status of the program and provide an index for measurement of future developments and trends.

Conclusions:

1. The apprentices were largely in their twenties with a high school diploma, were married fathers, and came from families of skilled workers.

2. Most had heard little about apprenticeship training while in high school.

3. Over 50 per cent attended classes 2 nights a week.

4. Few of the group were recruited and selected on the basis of a well organized program.

5. Joint apprenticeship committees evaluated the progress of apprentices every six months.

53. A Study of Instructional Program for the Related Subjects Instruction of Carpentry Apprentices. Rosander, William A. Masters Thesis, Purdue University, 1954, 20 pp.

Purpose: To ascertain the practices and opinions of instructors of related subjects for carpentry apprentices with reference to subject matter, performance, social and economic areas, testing, attendance, and records.

Conclusions:

1. There was a wide difference between actual practices of instructors and what they believed desirable, particularly in the performance area.

2. The survey indicated a significant difference of opinion between instructors and tradesmen regarding subject matter in social and civic areas, type of skills and the requirements the apprentice should meet.

3. In all programs studied some type of testing was being provided and some type of records were kept.

54. Fundamentals of Trade Education Designing and Drafting in the Education of the Apprentice. Barnett, Edward L. Masters Thesis, State University of Iowa, 1940, 53 pp.

Purpose: A study considering the problem of apprenticeship as a whole, with particular emphasis on the interrelated problem of designing and drafting as a part of apprentice training, with suggestions bearing on the ultimate solution of these interrelated problems.

55. A Recommended Program of Related Instruction for Electrical Apprentices. Luff, Andrew C. Masters Thesis, University of Michigan, 1950, 117 pp.

Purpose: To present a program of related instruction to be incorporated with the established program for electrical apprenticeship in the Kalamazoo, Michigan area.

Conclusions:

1. It is believed that this program is unique in its use of the complete facilities of a technical institution for the presentation of material.

2. It is possible that the program herein outlined may serve as a guide to other communities faced with similar problems.

56. High School Elective Courses Important to the Preparation of Industrial Trades Trainee. Groff, Howard J. Cooperative Industrial Apprentice Training Program, 616 20th Street, Rock Island, Illinois, 6 pp.

Purpose: Compiles a list of high school subjects amd ranks them in order of importance for a young man preparing to become a skilled worker.

57. A Survey of the Development and the Selection of Related Instruction Materials for Apprentices. Podras, John F. Masters Thesis, Purdue University, 1950, 78 pp.

Purpose: To find the efficiency of each type of teaching as carried on by apprentice instructors in 5 selected cities in Indiana.

Conclusions: City Number 1: Material was developed locally; City Number 2: Based on a formal trade analysis; City Number 3: Individual instruction sheets were developed by teachers; City Number 4: Individual instruction sheets were used as developed by an informal curriculum committee; City Number 5: Material was developed locally, but is non-organized. The teacher uses texts as the need may arise.

58. The Development and Organization of Related Subject Matter for Apprentices in the Machinist Trade. Hansen, Arthur A. Masters Thesis, University of Michigan, 1941.

59. Metallurgy for Machine Shop Apprentices. Spangler, Albert J. Masters Thesis, University of Akron, 1943.

Purpose: A histrocial accounting of the preparation of instructional material for the teaching of metallurgy to machine shop apprentices.

60. A Course of Study in Applied Science for Machine-Shop Apprentices. Axelrod, Aaron. Doctoral Thesis, New York University, 1951, 355 pp.

Purpose: To develop a course of study in applied science which will be directly related to usual jobs performed by apprentices in machine shops during their term of apprenticeship.

Conclusions: 1. A course of study was developed that can provide a definite program of science instruction as related to machine shop procedures.

61. Course in Non-Technical Problems for Apprentices in Kenosha, Wisconsin. Chubb, Oliver. Doctoral Thesis, Colorado Agricultural and Mechanical College, 1949, 51 pp.

Purpose: To prepare a course dealing with non-technical problems an apprentice or journeyman faces. Based on suggestions by apprentices and a group of journeyment in Kenosha during 1946 to 1949.

Conclusions:
1. Many problems, other than technical craft problems, confront craftsmen and apprentices.
2. The school can be of service to the apprentice by giving instruction pertaining to certain of these problems.

62. Related Science for Apprentices. Drew, Alfred S. School of Vocational and Adult Education, West Allis, Wisconsin, 1953.

Purpose: To determine whether there are fundamental science concepts or topics that are common to many trades. A rating list of 72 suggested topics was developed and sent to educators, members of industrial training staffs, and tradesmen.

Conclusions:
1. It appears that suitable science topics can be identified for presentation to a mixed group of apprentices.
2. Though some positive correlation between the rating of topics by educators and men in industry was evident, a higher degree is desirable.
3. There is evidence that further research is needed in this area.

63. An Analysis of Apprentice Enrollments in Wisconsin Schools of Vocational and Adult Education, 1927-1953. Kreuger, Marvin L. Masters Thesis, Stout State College, 1954, 66 pp.

Purpose: To secure and analyze data concerned with Wisconsin apprentice enrollments.

Conclusions:
1. There is no uniform relationship between the number of apprentice enrollments in the city vocational schools of Wisconsin and the population of those cities in which the schools are located, or between the apprentice enrollments in Wisconsin vocational schools and the number of individuals engaged in non-agricultural occupations.
2. There has been no steady increase of apprentice enrollments in Wisconsin vocational schools from 1927-1953.

ON-THE-JOB-INSTRUCTION

64. Suggested Content for Student Apprentices in General Electric Work. Barnes, Edwin. Masters Thesis, Oklahoma Agricultural and Mechanical College, 1939.

65. Selection of Instructional Material for Apprenticeship and Trade Extension Training. Trefz, William A. Masters Thesis, The Stout Institute, 1947, 158 pp.

Purpose: On the basis of expressed needs of workers at the Manitowac, Wisconsin Shipbuilding Company, a course of study is developed for apprenticeship and trade extension training for machinist workers of the company.

66. A Survey of Related Work for Machinist Apprentices. Hein, Wilbert R. Masters Thesis, Stout State College, 1951, 63 pp.

Purpose: To ascertain to what extent the fundamental operations, as related to machine shop, are being demonstrated to apprentices, and the evaluations placed on these operations by teachers in the field.

Conclusions: 1. The activities of the teachers in the field have been analyzed and placed in an order of rated importance for the convenience of new teachers interested in apprenticeship problems.

2. The order of preference of the list of demonstrations must be revised continually to adapt it to the varying conditions of training.

67. On-The-Job-Training. Freund, Raymond J. Masters Thesis, University of Minnesota, 1948, 218 pp.

Purpose: A study of on-the-job training and apprenticeship, including different on-the-job training procedures.

68. The Project Method Applied to Curriculum Construction in the Apprentice Schools of United States Navy Yards. Moss, Louis Q. Doctoral Thesis, Temple University, 1938 157 pp.

Purpose: A historical study of the development of apprentice training and related instruction in United States Navy Yards. Twelve criteria for the development of project curricula in related subjects of apprentice training were submitted to 118 experts for opinion.

SELECTION PRACTICES

69. Comparative Selective Devices for Shipyard Apprentices. Thomas, Loyal P. Masters Thesis, University of Southern California, 1944, 194 pp.

Purpose: A study of selective factors used in connection with the pre-apprentice training program of the United States Naval Drydocks, Terminal Island. It attempts to correlate all observable factors for the special group studied.

70. Practices Employed in Selecting Students for Technical Curricula and Their Relation to the Student Completion Rate. Wold, Kenneth M. Doctoral Thesis, University of Missouri, 1961, 287 pp.

Purpose: To ascertain the practices employed in selecting students for technical (engineering-related) curricula in institutions which offer technical programs and to ascertain the relation of these practices to the student completion rate.

Conclusions:

1. There appears to be greater emphasis on preferred scholastic averages of "C" or "B" as compared with higher averages for applicants.
2. Relatively little attention seems to be given to selection methods and devices other than an application form, references, and an orientation program when selecting applicants.
3. The use of tests and interviews for the selection and/or screening of applicants appears to be far from reaching the level of greatest potential.
4. There appears to be no statistically significant relationship between student completion rate in technical curricula and the following: entrance requirements, selection methods and devices, and type of school control.
5. It appears that applicants generally being attracted to technical curricula are below the caliber capable of completing such curricula successfully.

71. Practices in the Selection of Apprentices for Training and Their Relation to the Completion Rate. Johnson, Marvin E. Doctoral Thesis, University of Missouri, 1959.

Purpose: To ascertain the practices employed in the selection of apprentices in a group of apprenticeship training programs, and to find out the extent to which the selection policies, practices, and devices used in the apprenticeship training programs varied with apprentice completion rate.

Conclusions:

1. The sons and relatives of craftsmen and companies' employees were the major sources of applicants for apprenticeship training.

2. Many devices were used in the selection of apprentices, such as personal interviews, application forms, references, testing, and probationary period.

3. No correlation was found between apprentices completing training and selection devices used.

72. Apprenticeship Selection Practices in Michigan's Manufacturing Companies. Hagemyer, Richard H. Summary of Doctoral Thesis, Wayne State University, 1961, 27 pp.

Purpose: To inventory selection practices in Michigan's manufacturing industries and determine their relative importance in the selection process.

Conclusions:

1. Factors that were most important in the selection of apprentices were: possession of manipulative skills; good work experience record; recommendations by school and previous employer; completion of high school; high school courses in algebra, geometry, shop mathematics, and industrial education; and related hobbies.

2. Factors of lesser importance were: high school grades, seniority in company, family relationship, recommendation of friends.

3. Standardized tests were used by many large companies. Most small companies, however, make selections without knowing an applicant's potential as indicated by scores on mechanical aptitude, mental ability, and specific skill tests.

4. A probationary period is generally used as a final phase of the selection procedure.

5. Michigan manufacturing companies, with few exceptions, are not facing up to their responsibilities for providing trained craftsmen. Only 3.59 per cent of the small manufacturing companies in Michigan maintain apprenticeship programs.

6. Any large increase in the number of apprentices being trained in Michigan must be achieved by the development of programs in those companies not presently maintaining an apprenticeship program.

7. The United States can no longer depend on immigration of highly skilled craftsmen from Europe to meet the increasing need for skilled manpower.

73. Qualities and Skills Central Missouri Employers Seek When Employing Apprentices. Graf, Max G. Masters Thesis, Colorado State College, 1938, 55 pp.

Purpose: An investigation presenting the qualities and skills needed by employees of Central Missouri, as determined by the employees.

74. An Investigation of the Validity of Selected Criteria for Admission to a Vocational High School. Whitten, Benjamin C. Doctoral Thesis, Pennsylvania State University, 1961.

Purpose: The problem of the study was to discover criteria that have the greatest relationship to success in a vocational high school program and that can be used successfully to select students from applicants who have completed the ninth grade.

Conclusions:

1. Enrollment at the school studied be limited to applicants whose chances for success and promise of persistence are best.

2. That ninth grade attendance or the variables that were significant in the multiple correlations for achievement be used as criteria for admission.

3. That improved guidance services be developed for enrollees whose profiles predict poor achievement or persistence.

4. That vocational programs which are not rigid in their general education requirements be established for youth who do not meet the entrance requirements of the vocational high school program.

5. That favorable attitudes be developed among the personnel of sending schools towards the referral of more capable students to the vocational high school.

GUIDANCE

75. Apprentices Attitudes Toward Their Training and the Construction of a Diagnostic Scale. Freiger, H. E. Masters Thesis, Purdue University, 1937.

Purpose: Two equivalent attitude scales were constructed according to the Thurstone Equal Appearing Intervals Technique. The scales were administered to 227 apprentices and correlations were computed.

76. Industrial Apprenticeship in Contra Costa County, California, Niemela, A. W. Doctoral Thesis, Stanford University, 1949, 207 pp.

Purpose: To investigate the apprentice training program in Contra Costa County from the point of view of a guidance worker.

Conclusions:

1. Counselors should be thoroughly informed about the opportunities open to high school graduates through the avenue of industrial apprenticeship.

2. Careers in skilled trades should become an integral part of the occupational information program.

3. Educators should make a reappraisal of the place of the pre-apprentice training programs in high school.

77. A Study of Education, Vocational Training and Occupational Experience of Selected Inmates of the Indiana State Reformatory. Conaway, John O. Doctoral Thesis, Indiana University, 1961, 123 pp.

Purpose: To analyze the educational attainment, the occupational experience, and other selected characteristics of a sample of the inmates incarcerated in the Indiana State Reformatory.

Conclusions:

1. The employment opportunities of the subjects were limited to the low paying, unskilled jobs.

2. The most critical time for the subjects, who were also school dropouts, for securing employment was the first three years after leaving school.

3. There was a need for the development of follow-up, counseling, and placement services to assist the subjects and other school dropouts in making the transition from school to work.

4. Vocational Trade and Industrial Education courses were available to only a few of the subjects.

5. The treatment and rehabilitation division of the reformatory should utilize the knowledge concerning intelligence and occupational aptitudes in developing a training program for the inmates.

78. Technical Vocabulary and Its Relationships to Selected Student Characteristics and Industrial Education Programs. Randleman, Robert R. Doctoral Thesis, University of Minnesota, 1961.

Purpose: The study was undertaken to identify relationships between the sizes of students' technical vocabularies and scholastic ability, scholastic achievement, amount and nature of industrial arts and science instruction, and grade level.

Conclusions:

1. A positive relationship existed between the size of industrial arts and vocational students' technical vocabularies and their attainment on measures of intelligence and scholastic ability.

2. Factors other than general intellectual ability apparently contributed to technical vocabulary growth.

3. Relationships between technical vocabulary size and general intellectual ability appeared to be compatible with findings from research on general vocabulary.

4. The amount of industrial arts instruction taken by the students appeared to have an insignificant relationship to technical vocabulary size.

5. There appeared to be a positive association between the size of industrial arts students' technical vocabularies and grade level.

6. A direct and positive relationship existed between the size of vocational high school students' technical vocabularies and grade level.

79. A Study of the Educational Needs of the Employees of the Wood-Products Industries in Fourteen Counties of South Central Missouri. Hilterbrand, Luther R. Doctoral Thesis, University of Missouri, 1961.

Purpose: To determine the educational needs of the wood-products industries employees in fourteen counties of South Central Missouri.

Conclusions:

1. Based on the data available from the last decade more students from the fourteen county areas will attempt to find permanent work in the wood-product industries.

2. Training in vocational agriculture in the present program--on the whole--was judged inadequate for the employees of the industry.

3. The teachers of vocational agriculture do not know what to do about the problem of providing basic training for the industry and are often unaware the problem exists.

4. Further reorganization of school districts would facilitate possible types of basic training essential for employment in the industry.

5. The establishment of area vocational schools should make possible specific types of training which are not ordinarily available.

6. Instruction in conservation and forestry should be included in the curriculum offering of the high school,

80. Apprentice Dropouts in the Construction Industry. U. S. Department of Labor. Bureau of Apprenticeship and Training, Washington, D.C., 1960.

Purpose: An analysis of why apprentices discontinue training and what happens to them after leaving training.

Conclusions:

1. Approximately half of the workers apprenticed in the construction industry do not complete their training.

2. Financial consideration was a major factor in dropouts.

3. Two years later, 40 per cent were working in the trade in which they were apprenticed.

81. Characteristic Differences of Trade School Students and Their Bearing on Post-School Occupational Plans. Brown, B. W. Doctoral Thesis, University of Missouri, 1960, 211 pp.

Purpose: To isolate and compare characteristics of three groups of day-trade students: those who had chosen and were planning to enter the occupation for which they were being trained, those who had chosen an occupation other than the one for which they were being trained and who indicated no intention of working in the occupation for which the training was provided, and those who had made no occupational choice.

Conclusions:

1. Seniors who plan to engage in the occupation for which they are being trained are likely to be enrolled in large, urban area day-trade programs.

2. Seniors who intend to engage in the occupation for which they receive training are likely to enroll in the program as a result of their fathers' influence; those who have made no occupational plans are likely to enroll in the program as a result of influence by their classmates.

3. Seniors who intend to engage in the occupation for which they are being trained are likely to have fathers employed in skilled occupations.

4. Principals and trade teachers tend to believe that seniors who intend to enter an occupation other than the one for which they are being trained, or who have made no occupational plans, are enrolled in the day-trade program for exploratory purposes. Counselors believe these seniors are enrolled because they want to fix their automobile, because they cannot succeed academically, or because the program is exploratory in nature.

5. Principals, counselors, and day-trade instructors seem to be unaware of local, state, or national labor market needs, or the importance of this in enrolling students in the day-trade program.

82. Vocational Aspiration Levels of Adults. Wren, Harold A. Doctoral Thesis, Teachers College, Columbia University, 1941.

Purpose: To present the organizational structure and operational functions of the various groups involved in an industrial apprenticeship program in a major manufacturing company.

Conclusions:

1. The company believes that apprenticeship training has proved to be more practical in maintaining a supply of skilled workmen than any other plan.

2. Apprenticeship programs in new trades will be required as industry goes into the "push-button" factory age.

3. Management is inclined toward more careful selection and placement of apprentices; greater use is being made of tests and personal interviews.

4. The scope and content of related instruction has been improved. More attention has been given to the qualifications of apprentice training personnel.

83. The Vocational Needs of Youth. Ross, O. O. Masters Thesis, Colorado State College of Education, 1937, 188 pp.

Purpose: A study of apprenticeship training as a method of meeting the vocational needs of boys. Case studies and interviews of potential employers of Greeley, Colorado were the basis of the study.

FOLLOW-UP STUDIES

84. Survey of Completed Apprentices. California Department of Industrial Relations, Division of Apprenticeship Standards, Room 139, World Trade Center, San Francisco 11, California, 1957, 19 pp.

Purpose: To determine the economic advantages of having served as a registered apprenticeship; to provide public information on local and state levels regarding the apprenticeship program; to determine the value of apprentice program to industry and the nation in order that responsible labor, management, and government agencies may be guided accordingly.

85. Career Patterns of Former Apprentices. U. S. Department of Labor. Bureau of Apprenticeship and Training, Washington, D. C., 1959, 21 pp.

Purpose: The results of a survey of 3,278 workers who completed apprenticeship six years earlier.

Conclusions:

1. Six years after acquiring journeyman status 93 per cent were working in their trade or other apprenticable trades.

2. More than one-fourth had advanced beyond the journeyman level and were working in supervisory positions or as private contractors.

3. Virtually all former apprentices recommended enthusiastically the type of apprenticeship program that they had completed to others planning work careers in the skilled trades. However, more than half were of the opinion that their training could have been improved.

86. Follow-up Study of Former Apprentices. U. S. Department of Labor. Bureau of Apprenticeship and Training, Washington, D. C., 1954, 17 pp.

Purpose: A sample survey of persons who discontinued apprenticeship programs during 1951 and 1952.

Conclusions:

1. About one-half of the persons who dropped out of apprenticeship programs are now employed as craftsmen.

2. The principal reason for discontinuing training was financial consideration.

3. Relatively few persons dropped out because they did not like the trade or because they could not do the required work.

87. An Appraisal of Machinist Apprenticeship Training Programs by Means of a Follow-Up Study of Trainees. Koerble, Charles E. Doctoral Thesis, University of Wisconsin, 1955.

MISCELLANEOUS

88. Implication of Automation for Industrial Education. Sams, Denver. Doctoral Thesis, Indiana University, 1961, 136 pp.

Purpose: The study was concerned with determining the influence of automation upon on-the-job requirements for two groups of skilled tradesmen, toolmakers and machinist repairmen, and the consequent effectiveness of preparation of graduates of vocational machine shop programs for entry into the apprenticeship of the trades.

Conclusions:
1. There was no indication that automation had any real influence on the skill requirement of these trades.
2. Automation definitely brought increased importance to technical knowledge pertaining to the basic fundamentals of hydraulics, electricity, electronics, pneumatics, and the machine properties of plastics.
3. There was extremely close relationship of the training in the two trades.

89. Factors Affecting the Attendance of Apprentices at Technical Courses. Rosecrans, George L. Masters Thesis, University of California, 1950, 107 pp.

Purpose: To determine and evaluate some of the factors which contributed to or detracted from good attendance at apprenticeship classes.

Conclusions:
1. Amount of teaching experience of the teacher has little effect on attendance.
2. Greatest influence on apprentice was encouragement by journeymen with whom he worked.
3. Level of education did not seem to affect attendance.

90. An Evaluation of Corporation--Independent and Public School--Corporation Co-operative Apprentice Schools. Berguin, Paul E. Doctoral Thesis, Indiana University, 1945, 186 pp.

Purpose: A study which attempts to develop a set of standards which may be used to evaluate apprentice training programs.

91. A Survey of Current Practice in Allowing Credit Towards Apprenticeship for Full-Time Pre-Apprentice Training. Patrick, C. W. Masters Thesis, San Diego State College.

Purpose: To ascertain current practices in allowing credit toward apprenticeship for pre-employment training in the skilled trades.

Conclusions: 1. Full-time vocational programs, designed originally as a substitute for apprenticeship have tended, as the apprenticeship program has been revived and strengthened, to prepare youth for apprenticeship in the skilled trades.

92. The Relationship of Trade and Industrial Education to Apprenticeship Training. Hammer, Garland G. Doctoral Thesis, University of Missouri, 1951, 260 pp.

Purpose: To ascertain the existing and desired relations of trade and industrial education to apprenticeship training.

Conclusions:

1. There is need for better selection of apprentices based on interest, ability, previous training, and work experience.

2. Although apprenticeship may have been more successful in training workers from the skilled trades than the day trades school, there is still definite need for pre-employment training to lay a foundation for apprenticeship and to serve non-apprenticed occupations.

3. A definite number of hours of related instruction, varying with the trade, should be required of all apprentices.

4. Better supervision of related instruction is needed, and this should be done by public school personnel.

5. There is general agreement on the qualifications of instructors, supervisors, and administrators of apprenticeship training.

6. A need exists for a more positive attitude toward apprenticeship training.

7. State apprenticeship councils tend to improve apprenticeship and should be encouraged.

8. Both the state departments of labor and education should act in an advisory capacity concerning apprenticeship training.

93. Industrial Apprenticeship Training. Arthur, H.R., Masters Thesis, Wayne State University, 1953, 36 pp.

Purpose: To present the organizational structure and operational functions of the various groups involved in an industrial apprenticeship program in a major manufacturing company.

Conclusions:

1. The company believes that apprenticeship training has proved to be more practical in maintaining a supply of skilled workmen than any other plan.

2. Apprenticeship programs in new trades will be required as industry goes into the "push button" factory age.

3. Management is inclined toward more careful selection and placement of apprentices.

4. Attention is being given to improving instruction and training personnel.

RESEARCH IN PROGRESS

94. Apprentices Stated Reasons for High Drop-Out Rates in Apprenticeship Training in Utah. Mortimer, William E. Doctoral Thesis, Utah State University.

95. A Follow-Up Study of Apprentices in Michigan. Busby, Walter A. Doctoral Thesis, Michigan State University.

96. The Relationship of General Reading Ability and Other Factors to School and Job Performance of Machinist Apprentices. Drew, Alfred S. Doctoral Thesis, University of Michigan.

97. Apprenticeship Training in Ohio. Stiner, C.E. Doctoral Thesis, Kent State University.